

SOLUTION

Let two processes **P** and **Q** share a semaphore **mutex = 1**. The processes are defined as follows:

Process P begin P(mutex); print("A"); print("B"); print("C"); V(mutex); end;	Process Q begin P(mutex); print("D"); print("E"); V(mutex); print("F"); end;
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1) Among the following output strings, select those that can be displayed on the screen:

☒ ABCDEF
 ☒ DEFABC
 ☒ DEABCF
 ☒ DEAFBC
 ☒ DEABFC
 ☐ DABCEF

2) Using another semaphore **S** in addition to the **mutex**, initialize **S** and modify the processes so that the letter **F** is always displayed before the letter **C**, so that only the following strings can be displayed: **ABDEFC** or **DEABFC**.

The following strings are also allowed: DEFABC, DEAFBC

mutex: Semaphore: = 1; S: Semaphore: = 0 ;	
Process P begin P(mutex); print("A"); print("B"); V(mutex); P(S); print("C"); end;	Process Q begin P(mutex); print("D"); print("E"); V(mutex); print("F"); V(S) ; end;

2) Using only two semaphores **S1** and **S2**, initialize them and modify the processes so that only the string **DEABCF** can be displayed.

S1: Semaphore: = 0 ; S2: Semaphore: = 0 ;	
Process P begin P(S1); print("A"); print("B"); print("C"); V(S2); end;	Process Q begin print("D"); print("E"); V(S1); P(S2); print("F"); end;